

1 WIRELESS CONTROLLER WITH PUBLICLY-ACCESSIBLE  
2 COMMUNICATIONS LINK FOR CONTROLLING THE CONTENT  
3 SEEN ON LARGE-SCREEN SYSTEMS  
4

5 CROSS-REFERENCE TO RELATED APPLICATION  
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7 This is a non-provisional application which relies on provisional application # 60/223700 filed  
8 August 8, 2000.  
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10 FIELD OF THE INVENTION  
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12 The present invention generally relates to a method and system for communicating signals  
13 between handheld wireless communications devices and large-screen projection systems, or large-screen  
14 display systems, or both, via one or more publicly-accessible communications link. The invention  
15 provides the means for such devices to serve as interactive controllers of screen-content which is  
16 projected, or otherwise displayed, on such screen systems. More specifically, the wireless devices  
17 include personal digital assistants (PDAs), cell phones and the like, each having finger or thumb-  
18 operated push-buttons, or rotatable dials, or touch-screen operations, or any combination thereof, from  
19 which control signals are initiated by a user and then communicated through one or more  
20 communications link such as: the international global network (Internet); or via wireless services  
21 provided by one or more telephony service providers; or via other radio wave transmission; or light  
22 wave transmission, such that the control signals cause desired interactive control of content on one or  
23 more of the screen-systems according to user input.  
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## BACKGROUND OF THE INVENTION

In co-pending patents, the applicant of the present invention shows and describes various display systems, including immersive large-screen displays, that are suitable for the imaging of any one or more in a variety of projectable media content, or displayable media content, onto large-screens. In one of the co-pending patents, a cylindrical screen is shown which can be configurable into an oval shape, or circular shape, and is positionable in height relative to an audience such that a dual-perspective is offered, providing a circularity of action that can be seen on the screen. For example, when an audience views a dual-perspective screen from a vantage point outside of its outer perimeter while also viewing the screen from a vantage point below its lower perimeter, an oval car race can be seen in a contiguous and substantially circular action: a car appears on the leftmost side of the oval screen's outer perimeter and races to the rightmost side, after which, it appears on the inner perimeter of the screen and races from right to left (see illustrations for more details).

While such screens are ideal for portraying oval-track format races of various sporting events e.g. NASCAR Short-Track, horse races, Olympic ice skating, track & field, velodrome and the like, it is also possible to use such screens for oval-track video games and for people to interact with such games using handheld communications devices such as those proposed in the present invention.

For example, in the present invention, one or more intelligent controller(s) or microprocessor(s), control circuit(s) and software controlled by a telephony service provider, or other wireless communications network, are responsive to user-initiated control signal sent from wireless handheld devices such as cellular phones and PDAs. The wireless handheld devices have one or more user-input means to generate transmittable control signals including, but not limited to: a plurality of buttons, one or more rotatable dials, a microphone, or stylus-entry touch-sensitive screen. The control signals are assignable, or pre-determined, such that when an intelligent controller receives one or more transmitted control signals, the signal(s) is interpreted to effect screen content, or the movement of one or more screen-element, or one or more video game sprites, in a predictable manner on a rectangular, or arced, or

1 domed, or panoramic, screen. Thus, in the example of an oval car race on a panoramic screen, a user  
2 preferably first enters an access code to become a race participant: by pressing the proper sequence of  
3 buttons (e.g. alpha-numeric buttons) on the handheld device. Following the optional user-confirmation,  
4 the race can begin and user-input means, such as any of those previously described, can be used for  
5 controlling any one or more of a variety of race car characteristics, such as a car's: acceleration, steering,  
6 braking, gear shifting, and so on. Additionally, some control signals are sustainable, for example, the  
7 depression of a button can be sustained as desired (e.g. as a sustained tone), or a rotatable dial rotated to  
8 and held in a particular position, or a vocalized sound can be sustained, in each case, the acceleration,  
9 breaking, and steering of the race car as needed. Similarly, the buttons are assignable, or predetermined,  
10 according to the game played, for example, in the case of a game that simulates a battle, one or more  
11 user-input means can be used to control movement of an on-screen game character, or machine, or  
12 control weapons, or a character's weapons, and so on. Also, the user-input means can be employed for  
13 game selection, and the selection of game parameters can also be facilitated e.g. setting game-difficulty  
14 levels, game equipment options, and the like. The game choices and selections offer the types of utility,  
15 function and parameter settings of conventional video games that are viewed on a television screen.  
16 Such choices can be facilitated by real-time on-screen setup instructions such as those typically used to  
17 accept button-selection setup and choices, or can also be facilitated through a website having an user-  
18 interface (and software) that assists a user in configuring his or her button-choices and selections relative  
19 particular games.

20 Although, car-racing has been mentioned as a specific example of a type of game that can be  
21 controlled by the buttons of handheld devices having a suitable publicly-accessible communications  
22 link, it is also noted that any one or more in a variety of games are possible, and that numerous other, or  
23 new, games can be created to take advantage of the portability of such devices, and the public  
24 interactivity of one or more player/participants. Furthermore, it is also possible to have games that  
25 change or morph predictably according to pre-determined game thresholds, or that unexpectedly morph  
26 from one type of game to another. For example, a race may begin with NASCAR-type race cars and

1 suddenly switch each racing machine into a RENO air-race airplane flying around an oval course in the  
2 same, or opposite, direction. The aircraft may then switch into horses, or horses with carriages or  
3 chariots, and then to any in a variety of boats or ships, and so on. The system can also accommodate  
4 player interactivity by participants at different locations, such that a user at one location causes on-  
5 screen events to occur at one or more other location. The buttons of the wireless handheld devices are  
6 not limited to the control of games or game elements, the handheld devices can also be used to cause the  
7 switching of screen imagery including: cuts, dissolves, fades and the like (from one image, or composite  
8 of images, to another).

9 The system comprises commercially-available equipment for establishing a publicly-accessible  
10 communications link between one or more handheld devices and a wireless communications network, or  
11 telephony service provider. The system includes the type of wireless communications equipment  
12 commonly employed to establish a communications link with handheld devices of a type that are used in  
13 public places. Control signals initiated from a wireless device are directed by suitable signal control  
14 means to one or more intelligent controllers such as the combination of at least one microprocessor and  
15 software and/or firmware that are collectively responsive to the control signals. The microprocessor is  
16 powered by a suitable power supply, and in at least one embodiment of the system, includes software or  
17 firmware routines to create, maintain, amend and query, a storable database of assignable button choices  
18 and button parameters. In one embodiment the database is also accessible from one or more websites via  
19 the international global network (Internet).

## 20 21 PRIOR ART

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23 Investigation of patent documents has not yielded any prior art that seeks or accomplishes  
24 the benefits and advantages of the present invention via a publicly-accessible communications  
25 link between one or more handheld devices and a wireless communications network -- suitable  
26 for wireless communications with handheld devices of a type that are used in public places, and

1 of a type that provides interactivity with one or more public large-screen projection or display  
2 systems.

## 3 4 SUMMARY OF THE INVENTION 5

6 In accordance with the present invention, a public system for wirelessly controlling content seen  
7 on large-screen systems is disclosed. The system comprises at least one publicly-accessible large-screen  
8 display and display means for imaging screen-content onto the display. The display means can include  
9 any one or more in a variety of known type of imaging equipment including: one or more projectors and  
10 projection screens. The projection screens can be of type for receiving front or rear projections.

11 Alternatively, the screens can be formed of, or braced by, or made self-supporting, comprising one or  
12 more materials having sufficient rigidity to be self-supporting and/or comprised of pixelated material or  
13 a matrix of pixel elements. The system also comprises at least one wireless handheld device having user-  
14 input means suitable for sending at least one type of control signal initiated by a user and for  
15 transmitting the control signal(s) as identifiable control events or control signals. Such input means can  
16 include any one or more in a variety of known type of inputs from a wireless phone and/or personal  
17 digital assistant (PDA) including: push-button input, rotatable dial input, voice input (including voice-  
18 recognition vocal events), touch-screen input, stylus input (whether tapped in a particular spot of a  
19 touch-screen, or representing one or more stylus paths). The wireless handheld devices are suitable for  
20 establishing a communications link with a publicly-accessible wireless communications network. The  
21 network can include any one or more in a variety of known networks including: the international global  
22 network (Internet); a wide area network ('WAN'); a local area network ('LAN'); or, a telephony service  
23 provider such as Pacific Bell (in southern California), Cellular One (cell phone service provider), or  
24 Verizon Inc., Verizon Wireless, AT&T, and the like. The wireless communications network provides a  
25 communications link with one or more electrically powered intelligent controller such as a  
26 microcontroller and control-circuit. The intelligent controller includes any one or more in a variety of

known hardware, software and circuitry suitable for receiving and interpreting control signals of a type transmittable from one or more wireless handheld devices--and for controlling screen-content on one or more large-screen display in response to such user-input from the wireless device(s). The wireless communications network also provides control signal reception means such as any in a variety of known hardware, software and circuitry suitable for receiving control signals initiated by a wireless phone and/or personal digital assistant (PDA) and for routing such signals to one or more intelligent controller(s). The system also provides interactive control and optionally, parameter configuring of one or more video-game system and/or one or more video system, wherein at least one non-volatile memory is used for storing and retrieving parameters. The system also optionally provides storable and retrievable database records such game-in-progress status, game scores and so forth. The video-game system(s) and the video system(s) provide video signal output of controllable screen-content such that the screen-content, or screen-elements thereof, can be controlled, or switched, or modulated, by a wireless device used by one or more user, including one or more user at different locations when more than one large-screen display is employed at different locations.

#### BRIEF DESCRIPTION OF THE DRAWING FIGURES

The foregoing aspects and many of the attendant advantages of this invention will become more readily appreciated as the same becomes better understood by reference to the following detailed description, when taken in conjunction with the accompanying drawings, wherein:

FIGURE 1 is a block diagram illustrating components employed in the system for wirelessly controlling content seen on large-screen systems including means for receiving control signals from wireless handheld devices and means for interpreting those signals to determine controllable screen-content.

FIGURE 2 is partial three-dimensional view of a large-audience venue such as an arena, having a cylindrically configured screen suspended thereabove such that a multiplicity of vantage points providing a dual-perspective of an interior perimeter and exterior perimeter of the screen are offered and a circularity of action on the screen can be seen from those vantage points. Wireless handheld devices are depicted in communication with a wireless communications network to effect controllable screen-content (using wireless communications network components shown in Fig. 1).

## DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to FIG. 1, the principal components used to implement the present invention are seen in wireless controller system 10 which includes wireless handheld devices such as wireless telephone 12 and wireless personal digital assistant 'PDA' 34 each shown having a wireless communications link 32 with at least one publicly-accessible wireless communications network 30 such as a telephony service provider 50, Internet 52, WAN 54, LAN 56, or combinations thereof. The network 30 provides a communication link between telephone(s) 12, or PDAs 34, and one or more control signal reception means 60 which receives control signals from such portable or handheld devices. The control signals received by reception means 60 can include any one or more of the following event types: tone event(s) 62, voice event(s) 64, rotatable dial or button (switch) event(s) 66, or stylus event(s) 68, and the like.

For example, when a user presses a button on dialpad 14 of wireless telephone 12 such as: 'star' button 18, or pound button 20, or an auxiliary button 22, or an alpha-numeric button 16, or when a PDA push-button 44 is pressed or dial is rotated, a tone event 62, or button (switch) event 66, is received by reception means 60 and routed as a discreet signal to at least one electrically-powered intelligent controller such as microcontroller and control circuit 70. In another embodiment of the invention, reception means 60 is interactive with voice-recognition software (not shown in Fig.1) such as a type that is commercially available to individuals or businesses for deciphering and implementing a plurality

1 of voice commands. In such a case, reception means 60 receives voice commands sent through a  
2 microphone 26 of telephone 12. It deciphers them and sends each command as a discreet voice event 64  
3 to microcontroller and control circuit 70.

4 Another embodiment of the invention provides for the reception of PDA touch-screen events  
5 such as the pressing of a touch-screen button 42, or reception of another type of stylus event 68. For  
6 example, the result of the handwriting recognition of a PDA stylus 38 can be transmitted to network 30  
7 as alpha-numeric characters (e.g. ASCII keys) in which case, each character is routable to reception  
8 means 60 and sent to microcontroller and control circuit 70 as a discreet stylus event 68. Other stylus  
9 events are also similarly transmittable, for example stylus path 40 information--which is defined by the  
10 vertical location and horizontal location of the stylus contact point on a PDA's touch-screen (and a  
11 contiguous movement from those points to other of such points)--can be transmitted to network 30 and  
12 routed through reception means 60 as stylus event 68 which in turn is sent to microcontroller and control  
13 circuit 70 as stylus path information.

14 Any one or more handheld device transmittable event, such as event(s) 62, 64, 66, and 68 are  
15 then employable to effect controllable screen-content 88. For example, microcontroller and control  
16 circuit 70 has interactive communications with at least one video system 76, or at least one video game  
17 system 78, or combinations thereof. In each case, user-input received from a wireless handheld device is  
18 used to control screen content via: screen-content control means 80; or screen-content-switching means  
19 82, or screen-content modulating means 84; or screen-element control means 86; or, any combinations  
20 thereof. Means 80, 82, 84, and 86 are controlled by microcontroller and control circuit 70 according to  
21 user input/events and are comprised of any one or more in a variety of commercially available (or  
22 otherwise known) equipment suitable for controlling, switching, or modulating screen-content, or for  
23 controlling screen-elements, whether the source of the controllable screen-content 88 is provided by one  
24 or more video system, or by one or more video-game system. Thus, wireless handheld devices, of the  
25 system, provide a versatile controller means to effect the screen-content of one or more large-screen-  
26 display at one or more publicly-accessible venue.



1 With the employment of one or more video system 76 of wireless controller system 10, the  
2 physical push-buttons on telephone(s) 12, or on PDA(s) 34, or the graphically depicted buttons on a  
3 PDA's touch-screen, can be pre-assigned, or alternatively, programmed by the user, to effect any one or  
4 more in a variety of image controlling, switching, or modulating functions. For example, one or more  
5 push-button event, touch-screen event, stylus event, or voice event, can move an image, change an  
6 image, switch or modulate an image (e.g. cuts, fades, wipes, pans, dissolves, or other common video  
7 transitions or functions such as those effecting color ranges, color saturation, image sharpness,  
8 brightness, contrast, and so forth). For example, voice events can be used to switch video stills, or video  
9 action shots, such that the video system is responsive to recognizable voice commands and plays back  
10 imagery from a non-linear video storage according to video-image file category (such as a categorized  
11 video footage database record 74). Thus, a user speaking into the microphone of his or her wireless  
12 device can say a series of recognizable words such as: "waterfall", "ocean", "coral reef", "mountains",  
13 "sunset", "skyline", "constellations", "New York city" and have video formatted imagery exhibited by  
14 such verbal definitions on one or more large-screen display at one or more locations.

15 Similarly, with the employment of one or more video-game system 78 of wireless controller  
16 system 10, the physical push-buttons on telephone(s) 12, or on PDA(s) 34, or the graphically depicted  
17 buttons on a PDA's touch-screen, can be pre-assigned, or alternatively, programmed by the user, to  
18 effect any one or more in a variety of image controlling, switching, or modulating functions. For  
19 example, one or more push-button event, dial event, touch-screen event, stylus event, or voice event, can  
20 move an image, change an image, switch or modulate an image (e.g. cuts, fades, wipes, pans, dissolves,  
21 or other common video transitions or functions such as those effecting color ranges, color saturation,  
22 image sharpness, brightness, contrast, and so forth). Alternatively, one or more of input events can  
23 similarly effect screen-elements of the currently-played video-game. Thus, it is possible to have screen-  
24 elements that are moved by tone events, voice events, button or dial (switch) events, and stylus events  
25 (or by any combinations thereof). For example, certain push-buttons can cause a car in a car-race video  
26 game to accelerate, or decelerate, or turn left, or turn right, change gears and so forth. Alternatively, the

1 video-game system can be responsive to recognizable voice commands and change, switch move screen-  
2 elements according to recognizable voice commands such as “go”, “stop”, “slower”, “faster”, “right”,  
3 “left”, “up”, “down”, “jump”, “duck”, “dive”, “climb”, “fire”, “shoot”, “lookout!” and so forth.

4 Active user-input events are stored as pre-determined parameters, or alternatively as  
5 programmable parameters, in one or more non-volatile memory 72 of system 10. For example, when an  
6 auto race is exhibited on a large-screen display certain buttons on the PDA, or on dialpad 14 can be pre-  
7 assigned

8 Alternatively, the system optionally provides a software interface 58 that is responsive to user-  
9 input from a wireless device to facilitate on-screen selection of pre-determined, or programmable,  
10 parameters that effect screen-content of the video system(s) or video-game system(s). In one  
11 embodiment of the invention, the software interface is shown on an Internet website having text and/or  
12 graphic depictions of the (pre-assigned, or programmable) parameters. Computers, or PDAs, having  
13 website browsing means can access such a website for instructions and/or other interactive setup  
14 need(s). When parameters are programmable, the website interface offers means for browsing and  
15 selecting the parameters on-screen and for storing those parameters as needed according to the type of  
16 wireless device that will used. In another embodiment of the invention, video system parameters, and/or  
17 video-game parameters, are exhibited on one or more large-screen display 90 and the user can simply  
18 familiarize himself with needed information, and optionally scroll through the information by pressing  
19 one or more wireless device button (or by some other wireless device event among those previously  
20 described). For example, display 90 can show an access code on-screen, e.g. a telephone number, that  
21 users among a multiplicity of people must enter (dial) in order to qualify as an interactive participant  
22 with the video system(s) and/or video-game system(s). The system optionally provides a type of ‘Caller  
23 I.D.’ functionality such that users can be identified by name on-screen by the system’s analysis of  
24 identification phone numbers, or other identifiable codes, which are associated with the connected  
25 qualified wireless devices.777

1 In figure 2, a large-screen display 90 is depicted having a cylindrical shape and is positionable by  
2 a plurality of screen support 106 above an arena venue 92 that has inward-facing seats 94 from which a  
3 multiplicity of dual-perspective vantage point 130 is offered. Display 90 is shown having an screen  
4 upper-perimeter 110, a screen lower-perimeter 112, a screen inner-perimeter 114, a screen outer-  
5 perimeter 116, such that a circularity of action is seen from each dual-perspective vantage point. For  
6 example, a car race seen from vantage point 130 would show a care racing from the leftmost side of a  
7 screen outer-perimeter 116 to a rightmost side thereof and then appear to be racing from right to left on a  
8 screen inner-perimeter 114 (as seen from under screen lower-perimeter 112). Such contiguous  
9 panoramic depictions can be exhibited on display 90 as a combination of projected screen segments 120  
10 (shown in dashed lines) projected from an array of projectors 118 wherein such components comprise a  
11 display means 128. It is noted in a co-pending patent by the applicant of the present invention that  
12 although the screen inner-perimeter 114 is seen from beneath a lower-perimeter 112 of the display 90,  
13 the display means could instead be positioned by screen supports 106 to a height where screen lower-  
14 perimeter 112 is adjacent to, or near to, the floor at the center of the arena and much of the screen inner-  
15 perimeter 114 would be seen from dual-perspective vantage points that peer over screen upper-perimeter  
16 110. Although display 90 is shown as a cylindrical and panoramic screen, it is noted that the large-  
17 screen displays of the present invention are not limited to such configurations. For example, large  
18 rectangular screens, can be used instead, such as the type used in large-screen theatres, or for IMAX®  
19 productions. In other words, screens employed by the system are not limited to shape, material or type.  
20 And user-input/event interactivity is also not limited to the shape, material or type of screen used.

21 In operation, regardless of the screen shape, material or type used, it can be seen that one or more  
22 buttons, or one or more events, received from wireless handheld devices by the system, can be  
23 interpreted to serve as control signals effecting the screen-content on one or more large-screen display  
24 located at one or more locations. As mentioned above, such events include voice commands in addition  
25 to tone or button events. Such that voice commands such as “left”, “right”, “up”, “down”, “faster”,  
26 “slower” and so forth can be used to direct the movement of a player’s car in the case of an auto race

1 (and other game elements in other games). User-input also include various stylus events, including the  
2 means to translate stylus paths drawn on a PDA touch-screen into directions to move a player's car in  
3 the case of an auto race (and other game elements in other games). When the stylus point goes up on a  
4 touch-screen the game element can also go up. When the stylus goes to the right the element e.g. a race-  
5 car can go faster, when the stylus goes left on the touch-screen the car can slow down, and so on. The  
6 stylus events can also be translated as alpha-numeric events for games or quizzes requiring text and/or  
7 number entries, or for playing games on-screen that require any in a variety of user-inputted indicia e.g.  
8 an "X" or "O" in a tic-tac-toe game, or for drawing a certain type of image on-screen, and so forth.

9 The user establishes a connection with one or more wireless communications network 30 via a  
10 wireless communications link 32 to initiate interactive participation at one venue and can have versatile  
11 video-game (or video system) wireless controller interactivity with one or more screen at the same  
12 venue, while optionally interactively playing the same video-game with an opponent--on a screen  
13 suitable for the displaying the game--located at another venue. Similarly, users at one or more venues  
14 can use transmittable events from their respective wireless handheld devices to control, switch or  
15 modulate controllable screen-content 88 that is derived from one or more video systems. Game scores,  
16 or the status of games that are paused for subsequent play, can be stored and retrieved from one or more  
17 database records 74.

18 Although the present invention has been described in connection with the preferred form of  
19 practicing it, those of ordinary skill in the art will understand that many modifications can be made  
20 thereto within the scope of the claims that follow. Accordingly, it is not intended that the scope of the  
21 invention in any way be limited by the above description, but instead be determined entirely by the  
22 disclosure of the specification and by reference to the claims that follow. Following: